REMARKS

The application has been amended. In particular, claim 6 has been cancelled and the subject matter incorporated in independent claim 3. No new matter has been added. Claims 3-5 and 7-11 are pending in this application.

Claims 3, 5, 6 and 11 stand rejected under 35 U.S.C. §103(a) for obviousness over Japanese Patent 06158230 (hereinafter "JP '230").

Amended independent claim 3 is directed to an austenitic stainless steel that is less susceptible to cracking during forming. The composition includes approximately 0-0.04 mass % carbon, 0.1-1.0 mass % Si, 0-5.0 mass % Mn, 0-0.0060 mass % S, greater than 0 mass % and up to 0.003 mass % Al, 5.0-9.0 mass % Ni, 15.0-20.0 mass % Cr, 0-0.035 mass % N, 1.0-5.0 mass % Cu and the balance being Fe and inevitable impurities. The composition has a "d" value less than or equal to 0 and an "a" value greater than 0, where $d = 1.9\,Ni + 32C + 27N + 0.15\,(Mn + Cu) - 1.5\,Cr + 8.5$ and $a = Ni + 0.5\,Cr + 0.7\,(Mn + Cu) - 18$. The composition includes non-metallic $MnO\text{-}SiO_2\text{-}Al_2O_3$ inclusions with not less than approximately 15 mass % of SiO_2 and not more than approximately 40 mass % of Al_2O_3 dispersed in its matrix.

The JP '230 reference is directed to a stainless steel material for ultra high vacuum devices having corrosion resistance. The hot-rolling material includes at least 50% MnO, up to 50% SiO_2, and up to 30% Al_2O_3 non-metallic inclusions.

The JP '230 reference clearly fails to teach or suggest an austenitic stainless steel having a 'd' value less than or equal to 0 as recited in the equations of amended independent claim 3. Moreover, while the Examiner has indicated that JP '230 discloses an alloy with constituents, as well as nonmetallic inclusions, whose weight % ranges overlap those recited by the claims, none of examples 1-13 in the tables on pgs. 5 and 6 of JP '230 meet the austentic stainless steel composition or the "d" values recited in claim 3. In particular, example 1 in the tables on pgs. 5 and 6 of JP '230 discloses silicon content exceeding the claimed 0.1-1.0 mass % and examples 2-13 disclose nickel content exceeding the claimed 5-9 mass %. While the Examiner specifically cites to examples 9, 10, and 11 as meeting the claimed composition except for having slightly higher amounts of Mn, the nickel content in examples 9, 10, and 11 exceeds the claimed range.

Additionally, the Examiner asserts that examples 9, 10, and11 satisfy the "d" and "a" equations. Applicants respectfully disagree. The "d" and "a" values for examples 9, 10 and 11 are calculated as follows:

Example 9:

$d = 1.9\ Ni + 32C + 27N + 0.15\ (Mn + Cu) - 1.5\ Cr + 8.5$

$= 1.9\ (10.03) + 32(0.030) + 0.15(5.01+1.10) - 1.5(18.90) + 8.5$

$= 1.08$

$a = Ni + 0.5\ Cr + 0.7\ (Mn + Cu) - 18.$

$= 10.03 + 0.5(18.90) + 0.7(5.01+1.10) - 18$

$= 5.76$

Example 10:

$d = 1.9\ Ni + 32C + 27N + 0.15\ (Mn + Cu) - 1.5\ Cr + 8.5$

$= 1.9\ (10.16) + 32(0.031) + 27(0.0281 + 2.76) - 1.5(19.03) + 8.5$

$= 2.34$

$a = Ni + 0.5\ Cr + 0.7\ (Mn + Cu) - 18.$

$= 10.16 + 0.5(19.03) + 0.7(5.08+2.76) - 18$

$= 7.16$

Example 11:

$d = 1.9\ Ni + 32C + 27N + 0.15\ (Mn + Cu) - 1.5\ Cr + 8.5$

$= 1.9\ (10.03) + 32(0.030) + 27(0.0306) + 0.15(5.12+1.52) - 1.5(19.02) + 8.5$

$= 1.81$

$a = Ni + 0.5\ Cr + 0.7\ (Mn + Cu) - 18.$

$= 10.01 + 0.5(19.02) + 0.7(5.12+1.52) - 18$

$= 6.17$

While examples 9, 10 and 11 satisfy the "a" value > 0, the "d" values for examples 9, 10, and 11 are clearly not less than or equal to 0 and, therefore, accordingly cannot satisfy the claimed "d" value ≤ 0 recited in amended independent claim 3.

The particular values of "d" and "a" as presently claimed are important to achieving superior hardness and resistance to cracking during forming. The "d" value

represents an austenite balance. As the "d" value decreases, formation of δ-ferrite is accelerated in a high temperature zone during hot-rolling. The δ-ferrite phase dissolves harmful sulfur so as to raise an interfacial bonding power between austenitic and δ-ferrite grains. The austenitic stainless steel is in turn improved in hot-workability as further explained on page 8, lines 22-27 of the application. The "a" value on the other hand represents a hardening effect. As the 'a' value increases, an austenite phase of a cold-rolled steel sheet is stabilized without the formation of strain-induced martensite. Due to stabilization of the austenite phase, the austenitic stainless sheet is soft and easy to form to an objective shape without substantial work-hardening. Therefore, the claimed austenitic stainless steel can be formed without cracks by heavy-duty drawing or the like as a result of the "d" and "a" relationship defined in amended independent claim 3.

Additionally, the Examiner states on page 2 of the Office Action that an election was made without traverse in Paper No. 6, the Amendment filed on August 1, 2003. Applicants would like to respectfully direct the Examiner's attention to the papers filed on February 7, 2003 evidencing that the Election was made with traverse. Specifically, Applicants traversed the restriction between Group I - claims 3, 5 and 6, and Group II – claims 4, and 7-10. Both groups of claims are directed to the same chemistry composition and therefore it is apparent that searches directed to the claims in Groups I and II would clearly overlap each other. Such co-extensive searching would not present any undue burden on the Examiner for examination of the claims. Accordingly, reconsideration, withdrawal of the restriction and rejoinder of the claims deemed by the Examiner as withdrawn from further prosecution are respectfully requested.

In view of the claim amendments and foregoing remarks, Applicants respectfully submit that pending claims 3-5 and 7-11 distinguish over the prior art of record and are in condition for allowance. Reconsideration of the Examiner's rejections and allowance of the pending claims are respectfully requested.

Respectfully submitted,

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